Claims:

Amend the claims as follows:

Claim 1 (**currently amended**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, comprising the steps of:

receiving said complex Boolean function;

receiving said Boolean constant;

receiving said given subset of the input space; and

dividing said given subset of the input space into a set of a plurality of smaller subsets of the input space, whereby the equivalence is determined positive if said complex Boolean function is equivalent to said Boolean constant within every member of said set of a plurality of smaller subsets of the input space without representing said complex Boolean function as any Binary Decision Diagram.

Claim 2 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 1 further comprising the step of:

determining whether said given subset of the input space is a cube; and

simplifying, if said given subset of the input space is a cube, said complex Boolean function with substituting the input variables in said complex Boolean

function with Boolean constants according to the substitution requirements provided by said cube, whereby the conclusion is positive if the simplification result is said Boolean constant, and the conclusion is negative if the simplification result is a Boolean constant other than said Boolean constant.

Claim 3 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 2 further comprising the step of:

replacing said complex Boolean function with the simplification result of the simplifying step before the dividing step, whereby the simplification result is used as said complex Boolean function in all later steps.

Claim 4 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 1 wherein a member of said set of a plurality of smaller subsets of the input space is a cube within said given subset of the input space, whereby it is possible to substitute the input variables in said complex Boolean function with Boolean constants according to the substitution requirements provided by said cube.

Claim 5 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 4 further comprising the step of:

simplifying said complex Boolean function with substituting the input variables in said complex Boolean function with Boolean constants according to the substitution requirements provided by said cube, whereby the conclusion is positive if the simplification result is said Boolean constant, and the conclusion is negative if the simplification result is the Boolean constant other than said Boolean constant.

Claim 6 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 5 further comprising the step of:

repeating the dividing step and the simplifying step if the simplification result is not a Boolean constant, whereby said cube is smaller and the simplification result will eventually be a Boolean constant when said cube is small enough.

Claim 7 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 4 wherein said given subset of the input space is represented as a first range of binary integers.

Claim 8 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 7 wherein said set of a plurality of smaller subsets of the input space has only two members: said cube which is represented as a second range of binary integers, and a second member which is

represented as a third range of binary integers, whereby said third range of binary integers is divided repeatedly into cubes and such divisions do not need to all complete if the negative conclusion is given for any of these cubes.

Claim 9 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 8 further comprising the step of:

replacing said given subset of the input space, represented as said first range of binary integers, with said second member of said set of a plurality of smaller subsets of the input space, represented as said third range of binary integers, after finishing all steps related to said cube and said second range of binary integers which represents said cube, whereby said given subset of the input space become smaller and smaller and whether said complex Boolean function is equivalent to said Boolean constant within said given subset of the input space can be determined using simplification when said given subset of the input space eventually becomes a cube.

Claim 10 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 9 further comprising the step of:

shifting a boundary of said third range of binary integers before the replacing step if the corresponding boundary of said first range of binary integers is shifted, whereby a boundary of said first range of binary integers can shift dynamically.

Claim 11 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 4 further comprising the step of:

substituting the input variables in said complex Boolean function with Boolean constants according to the substitution requirements provided by said cube, whereby any tautology checking method can be used to process the Boolean function resulted from the substitution.

Claim 12 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 11 wherein said given subset of the input space is represented as a first range of binary integers.

Claim 13 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 12 wherein said set of a plurality of smaller subsets of the input space has only two members: said cube which is represented as a second range of binary integers, and a second member which is represented as a third range of binary integers, whereby said third range of binary integers is divided repeatedly into cubes and such divisions do not need to all complete if the negative conclusion is given for any of these cubes.

Claim 14 **(previously presented)**: A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 13 further comprising the step of:

replacing said given subset of the input space, represented as said first range of binary integers, with said second member of said set of a plurality of smaller subsets of the input space, represented as said third range of binary integers, after finishing all steps related to said cube and said second range of binary integers which represents said cube, whereby said given subset of the input space become smaller and smaller and whether said complex Boolean function is equivalent to said Boolean constant within said given subset of the input space can be determined using simplification when said given subset of the input space eventually becomes a cube.

Claim 15 **(previously presented)**: A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 14 further comprising the step of:

shifting a boundary of said third range of binary integers before the replacing step if the corresponding boundary of said first range of binary integers is shifted, whereby a boundary of said first range of binary integers can shift dynamically.

Claim 16 **(previously presented)**: A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 1 further comprising the step of:

determining whether said given subset of the input space is a cube; and

substituting, if said given subset of the input space is a cube, the input variables in said complex Boolean function with Boolean constants according to the substitution requirements provided by said cube, whereby any tautology checking method can be used to process the Boolean function resulted from the substitution.

Claim 17 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 1 further comprising the step of:

starting a process for each member of said set of a plurality of smaller subsets of the input space determining whether said complex Boolean function is equivalent to said Boolean constant within said member of said set of a plurality of smaller subsets of the input space, whereby these processes can run on the same computer or on several computers, at the same time or at different times.

Claim 18 (**currently amended**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 1 wherein said complex Boolean function is represented as a <u>netlist, whereby a high capacity is achieved by avoiding any Binary Decision Diagrams</u>~~directed acyclic graph~~.

Claim 19 (**previously presented**): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a

given subset of the input space, as in claim 1 wherein said Boolean constant is 1, whereby the method checks a conditional tautology.

Claim 20 (new): A method using computers for determining whether a complex Boolean function is equivalent to a Boolean constant within a given subset of the input space, as in claim 1 wherein said complex Boolean function involves significantly more than 100 Boolean variables.